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TITLE: The steel 40C10 microalloyed with boron

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TEXT: After a detailed discussion of the theory and practical experience relating to the microalloying of constructional steels with B in order to improve their temperability, some results are presented on an investigation of the effects of microquantities of B, added to the steel 40C10, upon its temperability and several of its mechanical properties. Ferroborn (with 16% B) was added after denitriding and deoxidation of the steel in the furnace by additions of ferro-titanium and aluminum. The B content in the steel varied between 0.0003 and 0.0052%, achieving degrees of assimilation in the range 30-90%. The results were compared with those obtained

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on B-free specimens subjected to the same treatment. No faults were observed in the macroscopic and microscopic examination of the specimens containing B, in comparison with those lacking it. An increase of the temperability (determined in accordance with STAS E 4950-55) by a factor of 1.5-2 was observed in the B-containing specimens, but no variation of the temperability with the B content was noted. The B content caused an increase in the tensile strength and in the yield limit. Comparative diagrams of the variation of the mechanical characteristics as a function of the recovery temperature (400-600°C) for B containing and B lacking 40C10 steel have made possible the determination of increases in the yield limit, the elongation, the constriction and the resilience for equal values of the tensile strength. There are 6 figures and 5 tables.

ASSOCIATION: Institutul de cercetări metalurgice (Metallurgical Research Institute)

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